	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	1 32	-0.41	0.08	2 95	NA
Difference	0 10	0 04	-0.01	-0.20	-0 02
Surprise	7.58%	9.76%	-12 50%	-6 78%	-0.49%

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Enter Symbol

3-Hold

Style Scores: C Value | F Growth | C Momentum | D VGM

Zacks Rank:

][3]

Industry Rank: Top 35% (88 out of 253)

Estimates

Next Report Date

\$119.08 USD

Updated Feb 25, 2021 04 04 PM ET

-3.49 (0.00%)

5/3/21 Earnings ESP

0.00%

Current Quarter

2.69 Current Year

8.09

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	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	3,22B	2.70B	11 57B	12.05B
# of Estimates	1	1	3	3
High Estimate	3 22B	2 70B	12 02B	12.57B
Low Estimate	3,22B	2 70B	11.21B	11.78B
Year ago Sales	3 03B	2.53B	11 37B	11 57B
Year over Year Growth Est	6 22%	6 78%	1 72%	4 21%

Earnings Estimates

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	2 69	1 69	8 09	8.56
# of Estimates	2	2	6	4
Most Recent Consensus	NA	2.36	7.64	7 89
High Estimate	3 02	1.77	8 48	8.89
Low Estimate	2 36	1 61	7 89	8.25
Year ago EPS	3,08	1,65	8.03	8.09
Year over Year Growth Est	-12.66%	2.42%	0 75%	5.77%

Agreement - Estimate Revisions

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	1	1
Up Last 60 Days	1	1	2	3
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	1
Down Last 60 Days	0	0	0	1

Magnitude - Consensus Estimate Trend

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	2 69	1 69	8 09	8,56
7 Days Ago	2 69	1.69	8 09	8.56
30 Days Ago	2.69	1 69	8 09	8.56
60 Days Ago	2.97	1 59	8 06	8.51
90 Days Ago	2.97	1.59	8 01	8 39

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	2.69	1.69	8 03	8 71
Zacks Consensus Estimate	2 69	1 69	8 09	8.56
Earnings ESP	0.00%	0.00%	-0.72%	1.75%

Surprise - Reported Earnings History

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	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	1.55	1 47	1.66	2.32	NA
Difference	0 35	-0 16	-0.01	0 76	0 24
Surprise	22.58%	-10.88%	-0 60%	32 76%	10.97%

Annual Estimates By Analyst

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2 03

14.72

ABR

PE PEG Ratio

Growth Estimates
Current Qtr (03/2021)
Next Qtr (06/2021)
Current Year (12/2021)
Next Year (12/2022)
Past 5 Years
Next 5 Years

1.89 P/E (F1)

SRE	IND	S&P
-12 66	8.24	7 20
2 42	69.45	110 26
0.75	6 70	10.74
5.81	5.60	9.20
9,90	3 50	8.00
7.30	9.40	NA
14 72	-4.00	22.01

-0 43

Learn More About Estimate Research See Brokerage Recommendations See Earnings Report Transcript

Premium Research for SRE

Zacks Rank

Hold 3

NA

Zacks Industry Rank

Top 35% (88 out of 253)

Zacks Sector Rank

Bottom 31% (11 out of 16)

Style Scores

C Value | F Growth | C Momentum | D VGM

Earnings ESP

Analyst | Snapshot

Research Reports for SRE

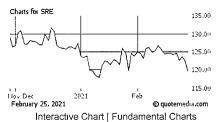
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Southwest Gas Corporation (SWX) (Delayed Data from NYSE)

\$64.11 USD

-0 90 (0 00%)

Updated Feb 25, 2021 04 00 PM ET

Add to portfo At Trades from \$1

Zacks Rai

Style Scores:
B Value | C Growth | F Momentum | C VGM
Industry Rank:

Top 35% (88 out of 253)

Industry: Utility - Oas Distribution

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5/6/21 Earnings ESP

NA

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/26/2021	SWX South	west Gas Corporation	on - Detailed Estimate	s - Zacks.com
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.00M	NA	3.39B	3.49B
# of Estimates	NA	NA	1	1
High Estimate	NA	NA	3.39B	3 49B
Low Estimate	NA	NA	3.39B	3.49B
Year ago Sales	836 32M	757.25M	3 12B	3 39B
Year over Year Growth Est	NA	NA	8 51%	3 07%
Earnings Estimates				
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	NA	NA	4.10	4 20
# of Estimates	NA	NA	3	1
Most Recent Consensus	NA	NA	NA	NA
High Estimate	NA	NA	4.13	4 20
Low Estimate	NA	NA	4 07	4.20
Year ago EPS	1.59	0.68	NA	4.10
Year over Year Growth Est	NA	NA	NA	2 44%
Agreement - Estimate Revis	sions			
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	NA	NA	0	0
Up Last 30 Days	NA	NA	1	0
Up Last 60 Days	NA	NA	1	0
Down Last 7 Days	NA	NA	0	0
Down Last 30 Days	NA	NA	1	1
Down Last 60 Days	NA	NA	1	1
Magnitude - Consensus Est	timate Trend			
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	NA	NA	4.10	4 20
7 Days Ago	NA	NA	4.10	4 20
30 Days Ago	NA	NA	4 13	4 45
60 Days Ago	1 78	0 56	4 16	4 38
90 Days Ago	1.78	0.56	4 26	4 38
Upside - Most Accurate Est	imate Versus Zacks (Consensus		
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	NA	NA	4.10	4 20
Zacks Consensus Estimate	NA	NA	4.10	4 20
Earnings ESP	NA	NA	0 00%	0 00%

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	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	1 62	0.19	0.40	1.53	NA
Difference	0 20	0.13	0.28	0 06	0 17
Surprise	12.35%	68.42%	70.00%	3 92%	38 67%

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ABR	2.50 P/E (F1)	15.64			
Growth Estimates			swx	IND	S&P
Current Qtr (03/2021)			NA	8.24	7 20
Next Qtr (06/2021)			NA	69.45	110 26
Current Year (12/2021	1)		NA	6.70	10.74
Next Year (12/2022)			2 44	5 60	9 20
Past 5 Years			NA	3 50	8 00
Next 5 Years			5 00	9 40	NA
PE			15 64	-4 00	22 01
PEG Ratio			3 13	-0 43	NA
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See Earnings Report	t Transcript				

Premium Research for SWX

Zacks Rank A Hold 3

Zacks Industry Rank Top 35% (88 out of 253)

Zacks Sector Rank Bottom 31% (11 out of 16)

Style Scores

B Value | C Growth | F Momentum | C VGM

Earnings ESP N.

Research Report for SWX Snapshot

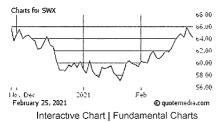
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UGI Corporation (UGI) (Delayed Data from NYSE)

\$39.75 USD

-0 43 (0.00%)

Updated Feb 25, 2021 04 00 PM ET

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Zacks Rank:

3-Hold

Style Scores:

B Value | D Growth | C Momentum | © VGM
Industry Rank:

Top 35% (88 out of 253)

Industria Italia - One Pretologo

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5/5/21 Earnings ESP

3.70%

Current Quarter

1.76 Current Year

2.90

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/26/2021	UGI: UGI Corporation - Detailed Estimates - Zacks.com				
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (9/2021)	Next Year (9/2022)	
Zacks Consensus Estimate	0 00M	NA	NA	NA	
# of Estimates	NA	NA	NA	NA	
High Estimate	NA	NA	NA	NA	
Low Estimate	NA	NA	NA	NA	
Year ago Sales	2.23B	1 20B	6 56B	NA	
Year over Year Growth Est	NA	NA	NA	NA	
Earnings Estimates					
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (9/2021)	Next Year (9/2022)	
Zacks Consensus Estimate	1.76	0.27	2 90	3 18	
# of Estimates	2	1	2	2	
Most Recent Consensus	NA	NA	2 93	NA	
High Estimate	1 82	0.27	2 93	3 25	
Low Estimate	1 69	0.27	2 87	3 11	
Year ago EPS	1 56	0 08	2.67	2.90	
Year over Year Growth Est	12 82%	237.50%	8.61%	9,66%	
Agreement - Estimate Revis	sions				
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (9/2021)	Next Year (9/2022	
Up Last 7 Days	0	0	0	(
Up Last 30 Days	0	0	1	(
Up Last 60 Days	0	0	0	(
Down Last 7 Days	0	0	0	(
Down Last 30 Days	0	0	0	(
Down Last 60 Days	0	0	0	(
Magnitude - Consensus Est	imate Trend				
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (9/2021)	Next Year (9/2022)	
Current	1.76	0 27	2 90	3 18	
7 Days Ago	1.76	0.27	2.90	3.18	
30 Days Ago	1.69	0 27	2 85	3 18	
60 Days Ago	1 83	0.14	2.86	3 1;	
90 Days Ago	1 83	0.14	2 86	3.1	
Upside - Most Accurate Est	imate Versus Zacks C	onsensus	Mile 20	• • • • • •	
	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (9/2021)	Next Year (9/2022	
Most Accurate Estimate	1 82	0 27	2 93	3.18	
Zacks Consensus Estimate	1 76	0.27	2 90	3 18	
	* * *				

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3.70%



0.00%

1.03%

0.00%

ABR 2.00 P/E (F1)

13.71

Growth Estimates	UGI	IND	S&P
Current Qtr (03/2021)	12 82	69 45	7.20
Next Qtr (06/2021)	237.50	-61 10	110 26
Current Year (09/2021)	8 61	6 70	10.74
Next Year (09/2022)	9.66	5 60	9 20
Past 5 Years	5,80	3 50	8 00
Next 5 Years	8.00	9 40	NA
PE	13.71	-4 00	22 01
PEG Ratio	1 71	-0 43	NA

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Premium Research for UGI

Zacks Rank 🛕 Hold 3

Zacks Industry Rank Top 35% (88 out of 253)

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Style Scores

B Value | D Growth | C Momentum | C VGM

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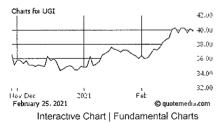
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Research for UGI

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Chart for UGI



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3 70%

2/26/2021

	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	1 11	-0,33	-0 15	1.50	NA
Difference	0 07	0 19	0 23	0 06	0.14
Surprise	6 31%	57.58%	153 33%	4 00%	55 31%

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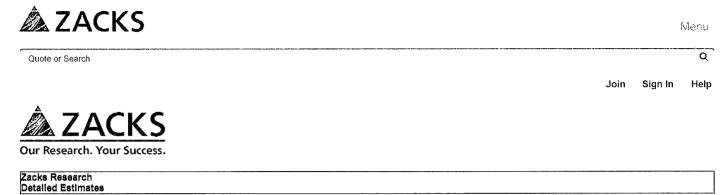
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WEC Energy Group, Inc. (WEC) (Delayed Data from NYSE) \$81.78 USD -0 15 (0 00%)

Updated Feb 25, 2021 04 00 PM ET

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Zacks Rank:

3-Hold 3 Style Scores:

C Value | F Growth | D Momentum | D VGM Industry Rank:

Bottom 30% (176 out of 253)

Detailed Estimates

WEC Energy Group, Inc. (WEC) Quote Overview » Estimates » WEC Energy Group, Inc. (WEC) Detailed Estimates

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Estimates

Next Report Date 5/3/21 Earnings ESP 0.00%

Current Quarter 1.67 Current Year 4.01

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	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	2.17B	1 57B	7.53B	7 75B
# of Estimates	1	1	2	2
High Estimate	2 17B	1 57B	7 67B	7 87B
Low Estimate	2.17B	1 57B	7 39B	7 63B
Year ago Sales	2 11B	1 55B	7.24B	7 53B
Year over Year Growth Est	3 14%	1.34%	3 98%	2 88%

Earnings Estimates

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	1.67	0 70	4.01	4.28
# of Estimates	1	1	4	3
Most Recent Consensus	1.67	0.70	NA	4.25
High Estimate	1 67	0 70	4 02	4 33
Low Estimate	1 67	0 70	4 00	4.25
Year ago EPS	1 43	0 76	3 79	4.01
Year over Year Growth Est	16 78%	-7 89%	5 80%	6 73%

Agreement - Estimate Revisions

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	1	1
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	1	0
Down Last 60 Days	0	0	1	0

Magnitude - Consensus Estimate Trend

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	1 67	0 70	4 01	4 28
7 Days Ago	1 67	0 70	4 01	4 28
30 Days Ago	1 67	0 70	4 01	4 30
60 Days Ago	NA	NA	4 01	4 29
90 Days Ago	NA	NA	4.00	4 29

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	1 67	0 70	4.01	4 25
Zacks Consensus Estimate	1 67	0.70	4.01	4 28
Earnings ESP	0 00%	0.00%	0 00%	-0.70%

Surprise - Reported Earnings History

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Growth Estimates	WEC	IND	S&P
Current Qtr (03/2021)	16.78	44.62	7.20
Next Qtr (06/2021)	-7.89	31 82	110 26
Current Year (12/2021)	5 80	4 80	10 74
Next Year (12/2022)	6.73	6.60	9 20
Past 5 Years	6 30	4 10	8 00
Next 5 Years	6.10	6 60	NA
PE.	20.39	16 30	22 01
PEG Ratio	3 34	2.47	NA

Learn More About Estimate Research

See Brokerage Recommendations

See Earnings Report Transcript

Premium Research for WEC

Zacks Rank

Zacks Industry Rank Bottom 30% (176 out of 253)

Zacks Sector Rank Bottom 31% (11 out of 16)

Style Scores

C Value | F Growth | D Momentum | D VGM

Earnings ESP 0.00%

Research Reports for WEC Analyst | Snapshot

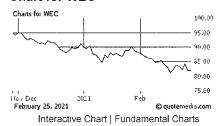
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More Premium Research » »

Research for WEC

Chart for WEC



Hold 3

	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	0 74	0 76	0.69	1.32	NA
Difference	0 02	0 08	0.07	0.11	0 07
Surprise	2.70%	10 53%	10.14%	8.33%	7.93%

Annual Estimates By Analyst

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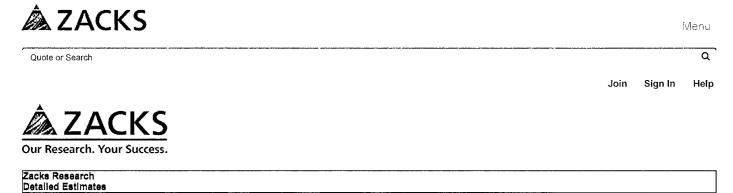
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Essential Utilities Inc. (WTRG) (Delayed Data from NYSE) \$43.25 USD

-0.84 (1.44%)

Updated Feb 25, 2021 04 00 PM ET

Add to portfo A Trades from (\$1 Zacks Rank:]3 [3-Hold Style Scores:
D Value | C Growth | C Momentum | C VGM Industry Rank: Bottom 26% (186 out of 253)

Utilities Inc. (WTRG) Quote Overview » Estimates » Essential Utilities Inc. (WTRG) Detailed Estimates Detailed View All Zacks #1 Ranked Stocks Enter Symbol

Estimates

Next Report Date 5/5/21 Earnings ESP Current Quarter

-2.11%

0.63 Current Year

1.67

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ABR	2.00 P/E (F1)	25.92		
Growth Estimates		WTF	G IND	S&P
Current Qtr (03/2021)		5	00 87 77	7 20
Next Qtr (06/2021)		-3.	45 158.37	110.26
Current Year (12/2021)		5	70 14 40	10.74
Next Year (12/2022)		7.	19 9.40	9 20
Past 5 Years		4 (5.10	8 00
Next 5 Years		6	30 10.20	NA
PE		25.	92 48.80	22.01
PEG Ratio		4.	13 4 78	NA
Learn More About Estim	ate Research			

Premium Research for WTRG

See Brokerage Recommendations

Zacks Rank Hold 3

Zacks Industry Rank Bottom 26% (186 out of 253)

Zacks Sector Rank Bottom 31% (11 out of 16)

Style Scores

D Value | C Growth | C Momentum | C VGM

Earnings ESP -2 11%

Research Report for WTRG Snapshot

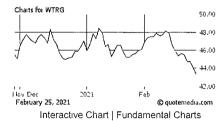
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Research for WTRG

Chart for WTRG



	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	773.00M	342.00M	2.05B	2 12B
# of Estimates	1	1	1	1
High Estimate	773.00M	342.00M	2.05B	2.12B
Low Estimate	773.00M	342 00M	2 05B	2.12B
Year ago Sales	255 59M	384 47 M	1 46B	2 05B
Year over Year Growth Est	202.44%	-11 05%	40.36%	3,17%

Earnings Estimates

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.63	0.28	1 67	1 79
# of Estimates	3	3	7	5
Most Recent Consensus	0 62	0.32	1 67	1 76
High Estimate	0.66	0.32	1 68	1.85
Low Estimate	0 62	0 22	1 65	1.76
Year ago EPS	0.60	0 29	1 58	1.67
Year over Year Growth Est.	5.00%	-3.45%	5.70%	7 27%

Agreement - Estimate Revisions

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	1	0
Up Last 30 Days	0	0	1	0
Up Last 60 Days	1	0	3	0
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	0	1	0	0

Magnitude - Consensus Estimate Trend

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0.63	0.28	1,67	1.79
7 Days Ago	0 63	0.28	1.67	1 79
30 Days Ago	0 64	0 26	1.67	1.79
60 Days Ago	0 46	0 33	1.66	1.80
90 Days Ago	0.46	0 33	1 66	1.80

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0 62	0 32	1 67	1.78
Zacks Consensus Estimate	0 63	0 28	1 67	1.79
Earnings ESP	-2.11%	14.29%	0.08%	-0.56%

Surprise - Reported Earnings History

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2/26/2021

	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	0 46	0 26	0 24	0.55	NA
Difference	0 00	-0 03	0.05	0.05	0 02
Surprise	0.00%	-11.54%	20.83%	9.09%	4 60%

Quarterly Estimates By Analyst

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Xcel Energy Inc. (XEL) (Delayed Data from NSDQ)

\$59.84 USD

-0.37 (0 00%)

Updated Feb 25, 2021 04 00 PM ET

Add to portfo

Zacks Rank:

4-Sell 4

Style Scores:

B Value | F Growth | A Momentum | C VGM Industry Rank:

Bottom 30% (176 out of 253)

cel and gy Inc. (XEL) Quote Overview » Estimates » Xcel Energy Inc. (XEL) Detailed Estimates

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Estimates

Next Report Date

5/6/21 Earnings ESP

0.00%

Current Quarter

0.59 Current Year

2,97

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	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	2 87B	2 64B	12.37B	12.70B
# of Estimates	1	1	3	3
High Estimate	2 87B	2.64B	13 13B	13 38B
Low Estimate	2.87B	2.64B	11.66B	12 02B
Year ago Sales	2 81B	2.59B	11 53B	12 37B
Year over Year Growth Est	2 03%	2 14%	7 28%	2 71%
C	At 27 28 2			

Earnings Estimates

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Zacks Consensus Estimate	0.59	0.51	2.97	3.17
# of Estimates	2	2	5	4
Most Recent Consensus	0.58	0.48	NA	3.15
High Estimate	0.60	0 54	3 00	3 17
Low Estimate	0 58	0 48	2 95	3.15
Year ago EPS	0.56	0 54	2.79	2.97
Year over Year Growth Est	5 36%	-5.56%	6.45%	6 50%

Agreement - Estimate Revisions

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	0	0
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	1	1
Down Last 60 Days	1	1	1	0

Magnitude - Consensus Estimate Trend

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Current	0 59	0 51	2 97	3 17
7 Days Ago	0 59	0 51	2 97	3 17
30 Days Ago	0 59	0 51	2 97	3.17
60 Days Ago	0 61	0 57	2 97	3 17
90 Days Ago	0.61	0.57	2.98	3.18

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (3/2021)	Next Qtr (6/2021)	Current Year (12/2021)	Next Year (12/2022)
Most Accurate Estimate	0 59	0 51	2 98	3.16
Zacks Consensus Estimate	0.59	0 51	2 97	3.17
Earnings ESP	0 00%	0 00%	0 27%	-0 16%

Surprise - Reported Earnings History

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ABR	2.70	P/E (F1)	20.14			
Growth Estimates				XEL	IND	S&P
Current Qtr (03/2021)				5 36	44.62	7.20
Next Qtr (06/2021)				-5 56	31 82	110 26
Current Year (12/2021)				6 45	4.80	10.74
Next Year (12/2022)				6 73	6 60	9.20
Past 5 Years				5.70	4 10	8.00
Next 5 Years				6.10	6 60	NA
PE				20.14	16 30	22.01
PEG Ratio				3 31	2.47	NA

Learn More About Estimate Research See Brokerage Recommendations See Earnings Report Transcript

Premium Research for XEL

Zacks Rank

▼ Seli 🖪

Zacks Industry Rank

Bottom 30% (176 out of 253)

Zacks Sector Rank

Bottom 31% (11 out of 16)

Style Scores

B Value | F Growth | A Momentum | C VGM

Earnings ESP

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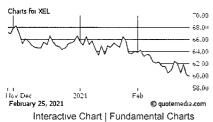
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Research for XEL

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	Quarter Ending (12/2020)	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Average Surprise
Estimate	0.54	1.08	0 46	0.59	NA
Difference	0 00	0 06	0 08	-0 03	0 03
Surprise	0.00%	5 56%	17.39%	-5.08%	4.47%

Annual Estimates By Analyst

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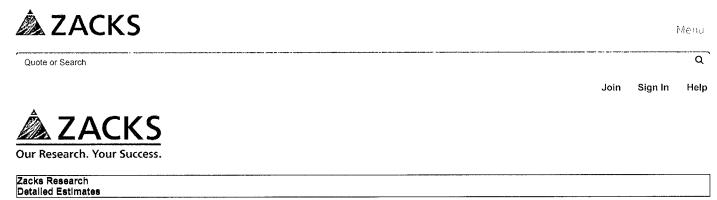
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The York Water Company (YORW) (Delayed Data from NSDQ)

\$42.16 USD

-1 16 (0.00%)

Updated Feb 25, 2021 04 00 PM ET

Add to portfo Add to portfo Add to portfo
Zacks Rank:
3-Hold 3
Style Scores:
Style Scores: D Value D Growth D Momentum F VGM
Industry Rank:
Bottom 26% (186 out of 253)

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3/9/21 Earnings ESP

0.00%

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	Current Qtr (12/2020)	Next Qtr (3/2021)	Current Year (12/2020)	Next Year (12/2021)
Zacks Consensus Estimate	13 00M	13 00M	54.00M	56.00M
# of Estimates	1	1	1	1
High Estimate	13.00M	13 00M	54 00M	56 00M
Low Estimate	13.00M	13 00M	54 00M	56 00M
Year ago Sales	13.02M	12.88M	51.58 M	54 00M
Year over Year Growth Est	-0.15%	0.93%	4.70%	3 70%

Earnings Estimates

	Current Qtr (12/2020)	Next Qtr (3/2021)	Current Year (12/2020)	Next Year (12/2021)
Zacks Consensus Estimate	0 26	0 29	1 25	1 29
# of Estimates	1	1	2	2
Most Recent Consensus	0 26	0 29	1 24	1 30
High Estimate	0.26	0 29	1 25	1 30
Low Estimate	0 26	0.29	1.24	1.27
Year ago EPS	0 26	0 31	1 11	1.25
Year over Year Growth Est.	0 00%	-6 45%	12.61%	3 20%

Agreement - Estimate Revisions

	Current Qtr (12/2020)	Next Qtr (3/2021)	Current Year (12/2020)	Next Year (12/2021)
Up Last 7 Days	0	0	0	0
Up Last 30 Days	0	0	0	0
Up Last 60 Days	0	0	0	0
Down Last 7 Days	0	0	0	0
Down Last 30 Days	0	0	0	0
Down Last 60 Days	0	0	0	0

Magnitude - Consensus Estimate Trend

	Current Qtr (12/2020)	Next Qtr (3/2021)	Current Year (12/2020)	Next Year (12/2021)
Current	0.26	0 29	1 25	1 29
7 Days Ago	0 26	0 29	1.25	1.29
30 Days Ago	0.26	0 29	1.25	1 29
60 Days Ago	0.26	0 29	1 25	1 29
90 Days Ago	0 26	0.29	1 25	1.29

Upside - Most Accurate Estimate Versus Zacks Consensus

	Current Qtr (12/2020)	Next Qtr (3/2021)	Current Year (12/2020)	Next Year (12/2021)
Most Accurate Estimate	0 26	0.29	1.25	1 29
Zacks Consensus Estimate	0 26	0 29	1.25	1 29
Earnings ESP	0.00%	0 00%	0 00%	0 00%

Surprise - Reported Earnings History

X

	Quarter Ending (9/2020)	Quarter Ending (6/2020)	Quarter Ending (3/2020)	Quarter Ending (12/2019)	Average Surprise
Estimate	0 34	0.28	0 23	NA	NA
Difference	0.02	0 04	0 08	NA	0 05
Surprise	5.88%	14 29%	34 78%	NA	18.32%

Quarterly Estimates By Analyst

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ABR	2.00 P/E (F1)	32.81			
Growth Estima	tes		YORW	IND	S&P
Current Qtr (12/2	2020)		0 00	87 77	7 20
Next Qtr (03/202	21)		-6 45	158.37	110 26
Current Year (12	2/2020)		12 61	14 40	-15 91
Next Year (12/20	021)		3 20	9 40	31.69
Past 5 Years			5 00	5 10	8 00
Next 5 Years			NA	10 20	NA
PE			32 81	48.80	28 98
PEG Ratio			NA	4.78	NA
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D Value | D Growth | D Momentum | F VGM

Earnings ESP 0.00%

Research Report for YORW Snapshot

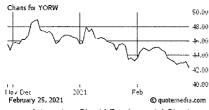
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Research for YORW

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WHEN "WHAT GOES UP" DOES NOT COME DOWN:

RECENT TRENDS IN UTILITY RETURNS

Charles S. Griffey, P.E., CFA¹ February 15, 2017

I. Executive Summary

- Returns on Equity (ROEs) granted to regulated utilities are near an all-time high relative to interest rates.
- Yet, the risks faced by regulated utilities are at an <u>all-time low</u>.
- Returns achieved by regulated utilities are equal to or greater than the returns of much riskier enterprises.
- Utilities could attract necessary capital at much lower awarded ROEs. Excessive ROEs encourage overbuilding and harm utility customers.
- Policymakers should reassess the ROEs being granted to utilities, and should be skeptical of requests for additional alternate rate-setting mechanisms without significant ROE reductions.

II. Overview

Awarded and achieved utility ROEs have been much higher than necessary to induce appropriate investment in recent years. Utility ROEs have failed to track either the utilities' level of regulatory risk or general economic indicators. This trend can drive inefficient investment decisions by utilities and inflates rates for utility customers.

The risks faced by most utilities today are significantly lower than over the last three or four decades.² For example, utilities are generally not attempting to place capital-intensive coal and nuclear plants in rates today, as natural-gas-fired generation has emerged as the preferred plant technology. Natural gas plants have a lower up-front capital cost, so they carry significantly less financial risk in a regulatory review than an expensive coal or nuclear plant.³

¹ Mr. Griffey is an energy consultant whose clients have included large industrial customers, generators, retail electric providers, electric cooperatives, municipal utilities, and the Staff of the Public Utility Commission of Texas. He is a former utility and energy company executive and is Adjunct Professor of Management at Rice University's Jones Business School.

² A view shared by the rating agency Moody's Investor Service (Sector-in-Depth Analysis, March 2015): "Across the US, we continue to see regulators approving mechanisms that allow for more timely recovery of costs, a material credit positive. These mechanisms, which keep utilities' business risk profile low compared to most industrial corporate sectors, include: formulaic rate structures; special purpose trackers or riders; decoupling programs (which delink volumes from revenue); the use of future test years or other pre-approval arrangements. We also see a sustained increase in the frequency of rate case filings."

³ https://www.eia.gov/forecasts/capitalcost/pdf/updated_capcost.pdf

The risks and uncertainty associated with transitioning to retail competition—such as the potential for stranded utility generation investment—have largely been settled, further reducing utilities' risk. Rate riders, interim "cost recovery factors," and other features that allow a utility to increase its rates without a full rate review have also proliferated over the past two decades, allowing accelerated capital recovery and substantially reducing regulatory lag in the ratemaking process. Over time, these and other factors have materially reduced risk for regulated utilities, making high risk premiums unnecessary to attract capital or induce investment.

Yet, ROEs for regulated utilities are higher than ever relative to US Treasuries. ROEs have not been significantly reduced to recognize the lower risk faced by regulated utilities today, or even general economic trends. Utility ROEs have not fallen at nearly the same rate as interest rates. One cause of this "stickiness" in regulated utility ROEs (compared to interest rates) is the peer-group methodology used by most ROE witnesses and often adopted by regulators. This approach is inherently backward-looking, and when each utility's ROE is based on the ROEs granted to the utility's peers, inflated utility ROEs are self-perpetuating. Further, as Public Utilities Fortnightly observed in its 2016 Annual Rate Case Survey, the trend of sustained, unnecessarily high ROEs for utilities is also a product of utility scare tactics in regulatory proceedings, where risk-averse regulators are led to believe that appropriately reducing ROEs will deter necessary investment—despite robust evidence to the contrary. As a result of these and other factors, utilities are receiving premium ROEs today compared to other industries.

The "risk premium" being granted to utility shareholders is now higher than it has ever been over the last 35 years. Excessive utility ROEs are detrimental to utility customers and the economy as a whole. From a societal standpoint, granting ROEs that are higher than necessary to attract investment creates an inefficient allocation of capital, diverting available funds away from more efficient investments. From the utility customer perspective, if a utility's awarded and/or achieved ROE is higher than necessary to attract capital, customers pay higher rates without receiving any corresponding benefit. Inflated ROEs also encourage utilities to make inefficient investment decisions so that they can earn a return on additional capital, harming both society and customers. As one observer has aptly noted, "When allowed equity returns exceed the true cost of equity, utilities have an artificial incentive to expand utility facilities upon which they can earn that extra return, including favoring themselves over others in resource procurement." This compounds the excess earnings for utilities and further increases rates for customers. In addition, the combination of low debt costs and high utility ROEs in recent years has encouraged a type of arbitrage known as "back-leveraging" or "double-leveraging," where a utility parent or holding company borrows money at a low rate to use as equity at the utility level. This common strategy of translating low cost debt at the parent into equity returns at the utility increases returns for shareholders even beyond the premium levels authorized by regulators.6

⁴ Cross, P., "2016 Annual Rate Case Survey," Public Utilities Fortnightly (Nov. 2016).

⁵ See Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016).

⁶ Notably, "back-leveraging" also creates significant risk for utility customers by increasing the financial stakes of a default, which could compromise the utility's financial integrity and impede appropriate investment to maintain reliability.

Importantly, an excessive utility ROE has more than a dollar-for-dollar impact on customer rates because rates are grossed up to cover federal income tax liability on utility earnings. Take, for example, a utility with a total rate base (total investment) of \$1 billion, and a capital structure of 40% equity, 60% debt, which is common. A one percent increase in this utility's ROE would not just translate to a rate increase of \$4 million, but to \$6.2 million because the return would be grossed up to cover corporate federal income tax liability (roughly 35%) on the additional earnings. Investor-owned utilities in Texas have an aggregate rate base of approximately \$25 billion. Historically, a typical utility risk premium would be in the range of 450 basis points above Treasuries (in other words, if 30-year treasury bonds yield 3%, the utility ROE would have been 7.5%). However, risk premiums have been on the order of 650 basis points over the last several years, with Treasury bonds at 3% and utility ROEs at 9.5%. In Texas, this 200 basis point differential means, all else being equal, rates could have been reduced by approximately \$300 - \$350 million annually without adversely impacting investment in utility infrastructure.

As a result of all these factors, utilities have been very profitable investment vehicles in the current economic climate, 10 and investors are eager to provide capital for utility infrastructure. Even if utilities do not achieve their allowed ROE, they have been successful in achieving a return in excess of their cost of capital. 11 Thus, there is no shortage of interest from both traditional utilities and non-traditional players such as pension funds, sovereign wealth funds, and private equity groups to invest in utility projects. This is, generally speaking, because the actual cost of capital required for investment is much lower than the ROEs being granted in the utility sector. A recent analysis concluded that most utility investors are looking for an annual rate of return around 7.5%, 12 while awarded utility ROEs have continued to be around 10%. 13 The result is a risk-adjusted rate of return that is superior to competing investments, and

 $^{^{7}}$ \$1 billion rate base * 40% equity in capital structure * 1% increase = \$4 million. Tax gross-up is \$4 million/(1-0.35) = \$6.2 million.

⁸ See Tietjen, D., "Alternative Ratemaking: Is It Time For A Shock To The Rate-Setting System?," presented to Gulf Coast Power Association, November 21, 2016. This figure does not include transmission investments held by municipally owned utilities or electric cooperatives, which are also included in the postage stamp transmission rates in ERCOT. Rate base equals net plant in service of \$33 billion from Mr. Tietjen's presentation, less ADFIT of \$8 billion, taken from each utility's earnings monitoring reports in the following docket: http://bit.ly/2ibTVke

 $^{^9}$ \$25 billion * 40% equity * 2%/(1-0.35) = \$308 million. Non-ERCOT utilities typically have approximately 50% equity in their capital structure, not the 40% used in Transmission and Distribution utilities in ERCOT, so the actual amount would be in excess of \$308 million.

¹⁰ Hyman, L. and Tilles, W., "Don't Cry for Utility Shareholders, America," Public Utilities Fortnightly at 65 (Oct. 2016).

¹¹ The cost of capital is set by the market, not regulators.

¹² Hyman, L. and Tilles, W., "Don't Cry for Utility Shareholders, America," Public Utilities Fortnightly at 65 (Oct. 2016).

¹³ See Cross, P., "2016 Annual Rate Case Survey," Public Utilities Fortnightly (Nov. 2016); see also Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016) at n. 8, citing recent FERC-issues ROEs in the 10% range for New England utilities.

higher than necessary to induce investment. The keen interest of numerous investors in recent utility mergers and acquisitions at premium prices is another sign of this phenomenon.¹⁴

The evidence showing that awarded utility ROEs far exceed the levels that actual risk factors and general economic trends would support is substantial, and mounting. As one author on this topic has stated, "[r]egulated utilities are less risky than competitive industries, and therefore are supposed to produce a lower total return over time. But instead the opposite is happening." ¹⁵

Mounting evidence indicates that awarded ROEs and actual utility earnings are too high, and that it is time to reevaluate the status quo and reduce utility ROEs to reflect actual risk and economic factors.

III. Current utility ROEs are higher than risk factors and economic trends support.

Rates of return for regulated utilities must achieve two competing goals: (1) they must allow the utility to attract enough capital to make the investments needed to provide reliable, continuous service, and (2) they must protect customers against monopoly pricing by ensuring that rates replicate what a competitive market would produce. A seminal scholar on utility regulation, James Bonbright, famously described the rate-setting process as follows:

Regulation, it is said, is a substitute for competition. Hence its objective should be to compel a regulated enterprise, despite its possession of complete or partial monopoly, to charge rates approximating those which it would charge if free from regulation but subject to the market forces of competition. In short, regulation should be not only a substitute for competition, but a closely imitative substitute.¹⁶

If a utility's awarded ROE is too low relative to its risk profile, the utility will not be able to attract capital, which will result in underinvestment. If a utility's awarded ROE is too high, customers will pay more than necessary to incentivize appropriate investment, and the utility will be encouraged to pursue inefficient investments and to "gold plate" infrastructure to inflate its returns. The overall economy is also harmed in these conditions because capital is inefficiently diverted from other potential investments.

With this context, a historical comparison of the returns earned on "risk-free" investments (represented here by thirty-year Treasury yields) and the ROEs granted to regulated utilities strongly suggests that utility ROEs are not appropriately tracking either the risk level of utility investments or general economic trends. As shown in Figure 1, both utility ROEs and Treasuries have fallen since the early 1980s, but the gap has widened because utility ROEs have not declined nearly as quickly as Treasury yields—particularly over the last ten years:

¹⁴ "Recent acquisition activity has been a little troubling, with above-average premiums being paid and, consequently, a more debt-financed profile to the transactions." Standard & Poors Ratings Service, "Industry Top Trends 2016," December 2015 at 22.

¹⁵ Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016).

¹⁶ Bonbright, J., Principles of Public Utility Rates at 3 (1966).

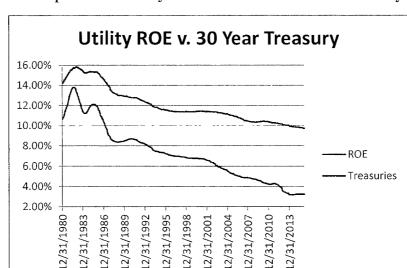


Figure 1: Comparison of Utility Allowed ROEs to 30-Year Treasury Yields¹⁷

This gap between utility ROEs and returns on "risk-free" investments represents a "risk premium." Risk premiums should compensate utility shareholders for the increased risk they bear relative to simply holding a theoretically risk-free asset—the 30-year Treasury bond in this case. As utility risk declines, the difference between utility ROEs and risk-free interest rates should become smaller—but the opposite is happening. The figure below focuses solely on the risk premium:

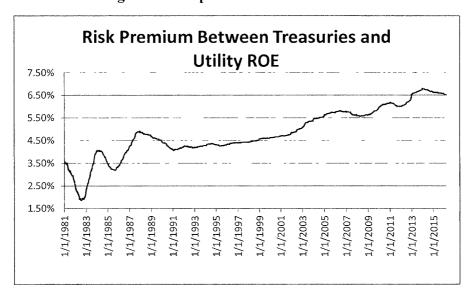


Figure 2: Comparison of Risk Premiums

¹⁷ Data is smoothed to be the 12-month moving average for both utility ROEs and Treasuries. Data is from SNL Financial and Bloomberg (see Direct Testimony of Robert Hevert in Docket 45414, Exhibit RBH-8, and Exhibit 1 to March 10, 2015 Moody's Sector-in-Depth Analysis for Electric Power).

As the chart above illustrates, the average risk premium over 1980-2016 was about 4.5%, or 450 basis points. Until the year 2000, risk premiums for utility investments had never exceeded 500 basis points. Since that time, the gap has steadily increased and stands at approximately 650 basis points today. If investing in utilities were riskier today than in the past, this result might be appropriate—but the opposite is true, as discussed below. Risk in the utility sector has declined over the last few decades, yet ROEs have not been reduced to reflect this lower risk, or even to track the general decline in expected yields from "risk-free" investments. This strongly suggests that the ROEs being granted to regulated utilities should be reevaluated.

IV. Texas: A Case Study

The utility business in Texas has become significantly less risky over the last two decades. From an investor's viewpoint, "risk" in the utility business includes anything that delays or prevents the investor from earning a return on invested capital. Among other factors, traditional utility risks include the potential that regulators may exclude an investment from rates (e.g., for imprudence in the construction of generating plant), significant delay between the time an investment is made and the time when it is reflected in rates (also called "regulatory lag"), and factors that influence utility revenues such as fluctuations in weather and load growth. Nationally, utilities have been successful in minimizing regulatory lag over the past decade through "alternative" rate mechanisms like future test years, formula rate plans, various riders to collect specific costs, and other forms of piecemeal (or "single-item") ratemaking. The chart below was created by a large multi-jurisdictional utility to show investors how little it relies on traditional rate cases compared to alternate ratemaking mechanisms to recover capital:

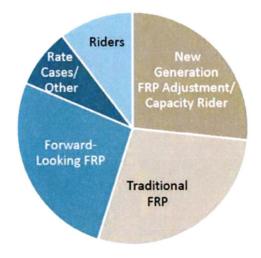


Figure 3: Illustrative Recovery of Incremental Utility Capital¹⁹

¹⁸ Regulatory lag is a complex issue, as it can both hurt and help investors depending on the circumstances. If a utility is over-earning, regulatory lag benefits shareholders by increasing the time it takes to adjust rates downward. When a utility is under-earning, regulatory lag can delay setting rates that reflect the utility's actual revenue requirement.

¹⁹ Entergy Presentation to Investors, February 26, 2016 at 13. http://files.shareholder.com/downloads/ETR/3875534036x0x877819/1D8DC9CC-7551-4A2F-8658-7DDB4147F73A/Handout - Investor Meetings Feb 26.pdf.

In Texas, there has been a profound trend of declining risk in the utility business over the last 15 years. Regulatory lag has been materially reduced (if not almost completely eliminated) for utilities—inside and outside of ERCOT—through the myriad of riders and cost-recovery factors that are now granted. Utilities can now increase rates without a full rate case to reflect: (1) transmission investment through Transmission Cost of Service (TCOS) and Transmission Cost Recovery Factor (TCRF) updates, ²⁰ (2) distribution investment through Distribution Cost Recovery Factor (DCRF) updates, ²¹ (3) purchased power contracts through the Purchased Power Cost Recovery Factor (PCRF), ²² (4) changes in fuel costs through the Fuel Factor, ²³ and (4) costs of complying with energy efficiency mandates through the energy efficiency cost recovery factor (EECRF). ²⁴ Many of these updates can be filed at the utility's discretion, which means utilities can selectively file only when they believe a rate increase is supported. Some of these mechanisms fail to account for potential reductions in related cost drivers, such as deferred federal income taxes (a reduction to rate base) and load growth. Given that these mechanisms largely eliminate risk and can actually *increase* a utility's earned return, it is indisputable that utilities in Texas face much less regulatory lag or risk than they did in the 1980s or 1990s.

In ERCOT, generation service is now competitive and is no longer provided by rate-regulated utilities. Compared to generation investment, transmission and distribution investment carries a much lower risk of being excluded from rates because: (1) the investments are more granular and gradual, and (2) the utility has significantly less discretion in defining the type of technology and size of the investment. This is particularly true in ERCOT, given that ERCOT independently studies and pre-approves the need for new, large transmission facilities.²⁵ Outside of ERCOT, utilities still retain some risk and regulatory lag associated with generation investment, but the shorter lead time and lower capital cost for natural gas-fired generation (which has been the leading technology for new utility generation) reduces the impact of regulatory lag and imprudence risk. When combined with the myriad rate riders discussed above, it is hard to dispute that regulatory risk has declined significantly for both ERCOT and non-ERCOT utilities.

Yet, utility ROEs have not declined as ratemaking theory, market factors, and risk analyses would predict. Instead, the risk premiums reflected in utility ROEs have caused regulated utility stocks to closely track the Dow Jones Industrial Average (DJIA), which is comprised of enterprises that are traditionally much riskier than the utility sector. Utilities have historically been "low-beta" stocks, meaning that they are inherently less risky and, accordingly, have traditionally had lower equity returns than the DJIA. But in the recent past, utility stocks

²⁰ PUC Subst. R. 25.192 and 25.193 (ERCOT) and 25.239 (non-ERCOT).

²¹ PUC Subst. R. 25.234 (both ERCOT and non-ERCOT).

²² PUC Subst. R. 25.238 (non-ERCOT).

²³ PUC Subst. R. 25.235 (non-ERCOT)

²⁴ PUC Subst. R. 25.181 (both ERCOT and non-ERCOT).

²⁵ By rule, the PUCT gives "great weight" to ERCOT's need determination. See PUC Subst. R. 25.101(b)(3)(ii).

have actually had *higher* returns than the DJIA, strongly indicating that utility ROEs are far above appropriate risk premium levels.²⁶

These high risk premiums for utilities allowing equity investor returns equivalent or superior than what is available in the markets generally, but for *a lower level or risk*. This runs completely counter to rationale economics or market theory. As one observer colorfully put it, "...if you want actionable [investment] intelligence up front, here it is: invest in regulated utilities."²⁷

As discussed below, a large part of the problem appears to be the feedback loop created when ROEs in regulated utility rate cases are set based on the historical ROEs awarded to *other* utilities. This approach makes it difficult to implement a significant change when economic conditions or regulatory changes would merit significant reductions in ROEs. Regulators are understandably hesitant to reduce ROEs relative to what other jurisdictions are awarding for fear of deterring investment, and utilities have been successful in appealing to this conservativism to keep ROEs higher than they should be. However, the data shows that it is imperative to overcome this collective action problem and broadly reevaluate whether regulated ROEs are at appropriate levels.

V. Time to Reassess

The foregoing discussion begs the question: why have utilities continued to receive inflated ROEs in spite of all these compelling factors? The primary drivers behind the "stickiness" of utility ROEs appear to be: (1) the method by which regulated utility ROEs have traditionally been established (the "peer-group" method mentioned previously), and (2) strategic utility appeals to the risk aversion of regulators when it comes to investment and reliability.

Regulators are responsible for making sure customers receive reliable electricity service from their monopoly provider—an issue that is keenly important to the public and policymakers. Because of this, regulators are understandably sensitive to arguments that reducing utility ROEs will decrease investment below an acceptable level, harm a utility's credit profile, or compromise reliability. In recent years, utilities appear to have been particularly successful in persuading regulators that any reduction in ROEs will have unacceptable consequences, despite extensive countervailing data. For example, utilities will often describe an ROE reduction as "credit negative" to deter regulators from pursuing such a reduction. Of course, it is always "credit positive" to grant utilities higher ROEs and "credit negative" to lower ROEs; this says nothing about appropriate return levels. Rebalancing must occur at some point, and reducing ROEs will not harm investment incentives if the reductions appropriately reflect the overall economic climate or the specific risks faced by a utility. Similarly, in its 2016 Annual Rate Case Survey, Public Utilities Fortnightly described a recent case where Michigan regulators set aside extensive record evidence and the Administrative Law Judge's ROE recommendation based on the utility's unsubstantiated claim that investors would view Michigan as a "volatile" regulatory

²⁶ Some analyses show that utility stocks have outperformed industrial stocks since 2004. *See* Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016).

²⁷ See Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016); Hyman, L. and Tilles, W., "Don't Cry for Utility Shareholders, America," Public Utilities Fortnightly at 65 (Oct. 2016).

environment if its ROE were set at 10%.²⁸ It cannot be the case that utility ROEs must only go up and never down, irrespective of industry risk or prevailing economic trends. Again, this claim of "volatility" was a successful scare tactic that resulted in an excessive awarded ROE.

Structural features of the ratemaking process can also make it difficult to reduce utility earnings to reflect lower risk profiles or overall market trends. As one industry analyst recently noted, "Utility rates also tend to be downward sticky. It is easier for a utility to initiate and prosecute rate increase than for consumer advocates to initiate and prosecute rate decreases, with an imbalance in information being one obvious reason why."²⁹ Utilities have a natural incentive to file a rate case when they believe a rate increase will be approved, but not when rates would be reduced. Many of the largest regulated utilities in Texas have not had a rate case in many years. For example, Oncor, the state's single largest utility, has not had a rate case in more than five years and still has an awarded ROE of 10.25%. ROEs are still being set in Texas in excess of 9.5%. Texas in excess of 9.5%. Texas in excess of 9.5%.

Critically, as noted above, the "peer group" method of setting ROEs can create a feedback loop that perpetuates inflated ROEs. The most commonly accepted starting point for setting a utility's ROE is through a peer group analysis, where a survey is conducted of the ROEs for utility companies are claimed to be "peers" of the utility in question. This methodology effectively creates an echo chamber, where past regulatory decisions inform future ROEs and undue conservatism is reinforced—often in the face of contrary market data. As the data discussed above indicates, the ROEs that would be justified by objective market data appears to be in conflict with current awarded ROEs. This indicates that "peer group" ROE methodologies should be revisited to better account for changes in utility risk and other economic factors, rather than relying almost exclusively on the returns that have been awarded in the past.

In fairness, utilities offer a number of arguments to support the current risk premiums in awarded ROEs. For one, utilities argue that the reduction in risk-free ROE yields is an aberration, and utility ROEs should be set based on longer periods or on a lagging/historical basis. While this theory could justify a temporary increase in the observed risk premiums for utility ROEs over one or two years, the trend has far outlasted the limits of this justification. The US has overwhelmingly been a low-interest rate environment since late 2008, and there are a number of structural reasons why these relatively low interest rates may continue.^{32,33} Yet, utility

²⁸ Cross, P., "2016 Annual Rate Case Survey," Public Utilities Fortnightly (Nov. 2016).

²⁹ Huntoon, S., "Nice Work If You Can Get It," Public Utilities Fortnightly (Aug. 2016).

³⁰ Application of Oncor Electric Delivery Company, LLC for Authority to Change Rates, Docket No. 38929, Final Order at Finding of Fact No. 32 (Aug. 29, 2011).

³¹ See, e.g., Year-end 2015 PUC Earnings Reports for Electric Utilities, Project No. 45636, Staff Memorandum (Oct. 21, 2016).

³² Rates for treasury bonds increased immediately following the recent election, but this increase is small (only an increase of about 45-50 basis points) relative to the drop in interest rates over the last decade, which has been hundreds of basis points. These interest rate increases are from historical lows – current treasury yields are at the same level as the beginning of 2016. Some investors are already seeing the Treasuries market as oversold and are recommending bond purchases instead. See http://www.wsj.com/articles/government-bond-sell-off-continues-on-trumps-economic-plans-1479114743 and http://www.wsj.com/articles/the-trump-trade-is-getting-out-of-hand-buy-some-bonds-1479143922.

ROEs have not been reduced to appropriately track this reduction over the past eight years. Utilities also argue that high risk premiums are correlated with low Treasury rates;³⁴ however, this argument confuses causation with correlation. The historical trend of risk premiums rising as Treasury rates fall is simply a reflection of the "stickiness" of high utility returns relative to interest rates, for the reasons discussed previously, and is not some independent economic principle that regulators should pursue. Utility ROE witnesses will also claim that unique utility business risks or size/scale issues support higher ROEs for particular utilities, but the reality is that there are no persuasive arguments for sustaining high risk premiums when risk in the utility business in Texas has been significantly reduced by legislative and regulatory changes, or when other comparably risky enterprises are earning lower returns in general. Notably, Moody's Investor Service has even concluded that reducing utility ROEs would not harm the credit profile of utilities in general because of the lower business risk and the many credit-positive cost recovery mechanisms that have been adopted.³⁵ This perspective from an independent bond rating agency reinforces the other substantial data demonstrating that reducing utility ROEs will not harm their ability to attract investment, and is a strong signal that the status quo should be holistically reexamined.

VI. Conclusion

The ROEs awarded to and achieved by regulated utilities are higher than needed to attract appropriate levels of investment. Customers and the economy in general would be well-served by a comprehensive reexamination of utility ROEs in light of relevant risk factors and economic trends. This includes reexamining the application of "peer-group" based ROE analyses, as well critical analysis of utility claims regarding the allegedly adverse impacts of reducing ROEs. Certainly, utility requests for "alternative" or "streamlined" ratemaking should be met with a rigorous analysis of the impacts that existing and proposed mechanisms have in shifting risk from the utility to its customers, and those impacts should translate to lower ROEs. In the world of utility ROEs, "what goes up" should also come down when risk factors and overall economic circumstances overwhelmingly support a lower level of returns.

³³ Structural reasons for low rates include the aging of the US population, persistent excess savings in the rest of the world, and lower productivity growth. *See* http://voxeu.org/article/causes-and-consequences-persistently-low-interest-rates and

https://www.allianz.com/v_1453369613000/media/economic_research/publications/working_papers/en/WPRealzins e.pdf.

³⁴ A utility ROE witness has made this argument in recent rate cases in Texas.

³⁵ Moody's Investor Service, Sector-in-Depth Analysis, March 2015.

Federal Open Market Committee

March 17, 2021: FOMC Projections materials, accessible version

Accessible version

For release at 2.00 p.m, EDT, March 17, 2021

Summary of Economic Projections

In conjunction with the Federal Open Market Committee (FOMC) meeting held on March 16–17, 2021, meeting participants submitted their projections of the most likely outcomes for real gross domestic product (GDP) growth, the unemployment rate, and inflation for each year from 2021 to 2023 and over the longer run. Each participant's projections were based on information available at the time of the meeting, together with her or his assessment of appropriate monetary policy—including a path for the federal funds rate and its longer-run value—and assumptions about other factors likely to affect economic outcomes. The longer-run projections represent each participant's assessment of the value to which each variable would be expected to converge, over time, under appropriate monetary policy and in the absence of further shocks to the economy. "Appropriate monetary policy" is defined as the future path of policy that each participant deems most likely to foster outcomes for economic activity and inflation that best satisfy his or her individual interpretation of the statutory mandate to promote maximum employment and price stability.

Table 1. Economic projections of Federal Reserve Board members and Federal Reserve Bank presidents, under their individual assumptions of projected appropriate monetary policy, March 2021

Percent

Variable		Media	ın			Central Ter	ndency			Rar
	2021	2022	2023	Longer run	2021	2022	2023	Longer run	2021	2022
Change in real GDP	6 5	3.3	22	1.8	5 8-6 6	3 0-3 8	2 0-2 5	1 8-2 0	5 0-7.3	2 5-4.4
December projection	4.2	3.2	2.4	1.8	3.7-5 0	3.0-3.5	2.2-2.7	1 7-2 0	0.5-5 5	2 5-4 (
Unemployment rate	4.5	3.9	3.5	4.0	4.2-4.7	3.6-4.0	3.2-3.8	3.8-4.3	4.0-5.5	3.2-4.2
December projection	5.0	4.2	3.7	4.1	4.7-5.4	3.8-4 6	3.5-4.3	3.9-4.3	4.0-6.8	3.5-5.8
PCE inflation	2.4	2.0	2.1	2.0	2 2-2.4	1.8-2.1	2.0-2.2	2.0	2.1-2.6	1.8-2.0
December projection	1.8	1.9	2.0	2.0	1.7-1.9	1.8-2.0	1.9-2.1	2.0	1.2-2.3	1 5-2 2
Core PCE Inflation ⁴	2.2	2 0	2.1		2 0-2.3	1.9-2.1	2.0-2.2		1.9-2.5	1.8-2.0
December projection	1.8	19	2.0		1.7-1.8	1.8-2 0	1.9-2.1		1.5-2.3	1.6-2.2
Memo Projected	l appropriat	e policy pat	h							
Federal funds rate	0 1	0 1	0 1	2 5	0 1	0 1-0.4	0 1-0 9	2.3-2 5	0.1	0.1-0 €

Variable		Median				Central Tendency				Rar		
	2021	2022	2023	Longer	2021	2022	2023	Longer	2021	2022		
				run				run				
December	0.1	0.1	0.1	2.5	0 1	0.1	0 1-0 4	2.3-2.5	0.1	0.1-0 ∠		
projection												

Note Projections of change in real gross domestic product (GDP) and projections for both measures of inflation are percent changes from the fourth quarter of the previous year to the fourth quarter of the year indicated. PCE inflation and core PCE inflation are the percentage rates of change in, respectively, the price index for personal consumption expenditures (PCE) and the price index for PCE excluding food and energy Projections for the unemployment rate are for the average civilian unemployment rate in the fourth quarter of the year indicated. Each participant's projections are based on his or her assessment of appropriate monetary policy. Longer-run projections represent each participant's assessment of the rate to which each variable would be expected to converge under appropriate monetary policy and in the absence of further shocks to the economy. The projections for the federal funds rate are the value of the midpoint of the projected appropriate target range for the federal funds rate or the projected appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. The December projections were made in conjunction with the meeting of the Federal Open Market Committee on December 15–16, 2020. One participant did not submit longer-run projections for the change in real GDP, the unemployment rate, or the federal funds rate in conjunction with the December 15–16, 2020, meeting, and one participant did not submit such projections in conjunction with the March 16–17, 2021, meeting

- 1. For each period, the median is the middle projection when the projections are arranged from lowest to highest. When the number of projections is even, the median is the average of the two middle projections. Return to table
- 2. The central tendency excludes the three highest and three lowest projections for each variable in each year. Return to table
- 3 The range for a variable in a given year includes all participants' projections, from lowest to highest, for that variable in that year. Return to table
- 4. Longer-run projections for core PCE inflation are not collected. Return to table

Figure 1. Medians, central tendencies, and ranges of economic projections, 2021–23 and over the longer run

Change in real GDP

Percent

I I I I I I I I I I I I I I I I I I I	2016	2017	2018	2019	2020	2021	2022	2023	Longer
									run
Actual	2.1	2.7	2 5	23	-2 4	-	_	-	-
Upper End of Range	-	u	-		-	7 3	4 4	26	2 2
Upper End of Central	-	-	-	-	-	6.6	38	2 5	2.0
Tendency									
Median	-	**	-		-	6.5	3.3	2.2	1.8
Lower End of Central	-	-	-	-	-	5.8	3.0	2.0	1.8
Tendency									
Lower End of Range		<u>-</u>	-	-	-	5.0	2 5	1.7	16

Unemployment rate

Percent

	2016	2017	2018	2019	2020	2021	2022	2023	Longer
									run
Actual	4 8	4.2	3.8	3.6	6.7	_	-	-	-
Upper End of Range	_	-	_	-	-	5.5	4 2	4.0	4 5
Upper End of Central	-	-	see		•	47	4 0	3 8	4 3
Tendency									
Median	-	-	-	-	-	4 5	3.9	3.5	4.0
				2.40					

	2016	2017	2018	2019	2020	2	2021	2022	2023	Longer run
Lower End of Central	-	-		-	-	-	4.2	3.6	3 2	3.8
Tendency										
Lower End of Range	-	-		-	-	-	4.0	3,2	3 0	3 5

PCE inflation

Percent

	2016	2017	2018	2019	2020	2021	2022	2023	Longer run
Actual	16	18	2.0	15	1.2	-	_	-	-
Upper End of Range	-	_	_	-	-	2.6	2.3	2.3	2.0
Upper End of Central	-	-	~	-	-	2.4	2.1	2.2	2.0
Tendency									
Median	-	-	-	-	-	2.4	2.0	2.1	2.0
Lower End of Central	_	_	-	-	-	2.2	18	2 0	2 0
Tendency									
Lower End of Range	_	-	-	-	-	2.1	1.8	19	2.0

Core PCE inflation

Percent

Annual - 1 - Annual -	2016	2017	2018	2019	2020	2021	2022	Longer run
Actual	1.8	1.7	2.0	1.6	14	-	-	-
Upper End of Range	-	~	-	-	-	2.5	2 3	2 3
Upper End of Central Tendency		-	-	-	-	2.3	2.1	2 2
Median	-	-	-	-	-	2.2	2.0	2.1
Lower End of Central Tendency	-	-	-	-	-	2.0	1.9	2 0
Lower End of Range						1.9	1.8	1 9

Note Definitions of variables and other explanations are in the notes to table 1. The data for the actual values of the variables are annual

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate

Number of participants with projected midpoint of target range or target level

	Midpoint of target range or target level (Percent)	2021	2022	2023	Longer run
3.000					2
2.875					
2.750					1
2.625					
2 500					8
2 375					1
2 250					4
2.125					
2.000					1
1.875					
1 750					
1.625					
	341				1

	Midpoint of target range or target level (Percent)	2021	2022	2023	Longer run
1.500					
1.375					
1.250					
1.125				2	
1.000					
0.875				3	
0.750					
0.625			1	1	1
0.500					
0 375			3	1	1
0 250					
0 125		18	14	11	

Note Each shaded circle indicates the value (rounded to the nearest 1/8 percentage point) of an individual participant's judgment of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate at the end of the specified calendar year or over the longer run. One participant did not submit longer-run projections for the federal funds rate.

Figure 3.A. Distribution of participants' projections for the change in real GDP, 2021–23 and over the longer run

Histograms, four panels.

Number of participants

Percent	Percent 2021		202	22	20	23	Longer run		
Range	December	March	December	March	December	March	December	March	
	projections	projections	projections	projections	projections	projections	projections	projections	
0.2 - 0.3									
04-05	•	1							
0 6 - 0.7									
0 8 - 0.9									
10-11									
12-13									
1.4 - 1.5									
1.6 - 1.7						1	2	4 3	
1.8 - 1 9						1	7	7 8	
2.0 - 2.1						1 5	4	1 5	
2.2 - 2 3						4 5	,	1	
2.4 - 2.5			:	2 2		7 5			
2.6 - 2.7				1		2 1			
2.8 - 2 9				1					
3.0 - 3.1				4 3		2			
3.2 - 3 3		1		5 4					
3.4 - 3.5		1	;	3 3		1			
3.6 - 3.7		1							
3.8 - 3 9		1		2				•	
4.0 - 4.1	2	2		2 1					
4.2 - 4.3	(3		1					
4.4 - 4.5	•	1		1					
4.6 - 4.7	,	2							
4.8 - 4 9									
5.0 - 5.1	3	3 1		342					

Percent	2021		202	22	202	23	Longe	r run
Range	December projections	March projections						
5.2 - 5.3								
54-55	1	1						
5.6 - 5.7		1						
5.8 - 5.9		2						
6.0 - 6 1		2						
6 2 - 6.3								
6.4 - 6.5		4						
6.6 - 6.7		5						
6.8 - 6.9								
7.0 - 7.1		1						
7 2 - 7.3		1						

Note. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.B. Distribution of participants' projections for the unemployment rate, 2021–23 and over the longer run

Histograms, four panels.

Number of participants

Percent	202	21	202	22	20:	23	Longe	r run
Range	December projections	March projections	December projections	March projections	December projections	March projections	December projections	March projections
2.8 - 2.9								
3.0 - 3.1						3		
3 2 - 3.3				3		1 1		
3.4 - 3.5			1		(5 7		1 2
3.6 - 3.7			2	2 5		4 3		
3.8 - 3.9			1	5		3	2	4
4.0 - 4 1	2	2 3	2	4 3		1 1	4	4
4.2 - 4 3		3	3	3 2	;	2	2	1 5
4.4 - 4.5	•	1 4	2	2	:	2	3	3 2
4.6 - 4.7	•	1 5	•					
4.8 - 4.9	2	2 2	,					
50-51	Į	5	•	1		1		
52-53	2	2						
5 4 - 5.5	-	1 1						
56-57	•	1						
58-59	•	1	,	l				
60-61								
6.2 - 6.3								
6.4 - 6.5								
6.6 - 6 7								
68-69	•	1						

Note. Definitions of variables and other explanations are in the notes to table 1.

Figure 3.C. Distribution of participants' projections for PCE inflation, 2021–23 and over the longer run

Histograms, four panels.

Number of participants

Percent	202	21	2022		20:	23	Longer run	
Range	December projections	March projections	December projections	March projections	December projections	March projections	December projections	March projections
0.9 - 1.0								
11-12	-	1						
13-14								
15-16			•	1				
1.7 - 1.8	12	2	4	4		1		
19-2.0	2	2	9	9 10	!	9 8	17	18
2.1 - 2 2	•	1 5	3	3 2	•	7 9		
2.3 - 2.4	•	1 11		2		1		
2.5 - 26		2						

Note Definitions of variables and other explanations are in the notes to table 1

Figure 3.D. Distribution of participants' projections for core PCE inflation, 2021–23

Histograms, three panels.

Number of participants

Percent	Percent 2021) 	2023		
Range	December projections	March projections	December projections	March projections	December projections	March projections	
1.3 - 1 4							
1.5 - 16	2		1				
17-1.8	12		6	2	1	ļ	
1 9 - 2.0	1	4	7	11	10	7	
2 1 - 2.2	1	10	3	3	6	10	
2 3 - 2.4	1	3		2		1	
2.5 - 2.6		1					

Note Definitions of variables and other explanations are in the notes to table 1.

Figure 3.E. Distribution of participants' judgments of the midpoint of the appropriate target range for the federal funds rate or the appropriate target level for the federal funds rate, 2021–23 and over the longer run

Histograms, four panels.

Number of participants

Percent	202	?1	2022		202	23	Longer run	
Range	December projections	March projections	December projections	March projections	December projections	March projections	December projections	March projections
0 13 - 0.37	17	18	16	5 14	12	? 11		
0.38 - 0.62			1	3	3	1		
				3/1/				

344

Percent	Percent 2021		202	22	202	23	Longe	r run
Range	December projections	March projections						
0.63 - 0.87				1	,	1		
0.88 - 1.12						3		
1 13 - 1 37					,	1 2		
1 38 - 1 62								
1 63 - 1 87								
1 88 - 2 12							1	1
2.13 - 2.37							3	3 4
2.38 - 2 62							Ş	9
2.63 - 2 87							1	1
2.88 - 3 12							2	2 2

Note: Definitions of variables and other explanations are in the notes to table 1.

Figure 4.A. Uncertainty and risks in projections of GDP growth Median projection and confidence interval based on historical forecast errors

Change in Real GDP

Percent

the High section of the Hi	2016	2017	2018	2019	2020	2021	2022	2023
Actual	2.1	2.7	2.5	2.3	-2.4	-	-	-
Upper end of 70% Confidence Interval	-	-	-	-	-	8 1	5 4	4 5
Median	-	-		m		6 5	3 3	2.2
Lower End of 70% Confidence Interval	-	_	-			4.9	1.2	0.1

FOMC participants' assessments of uncertainty and risks around their economic projections

Histograms, two panels.

Uncertainty about GDP growth

Number of participants

	Lower	Broadly Similar		Higher
March projections	0		3	15
December projections	0		1	16

Risks to GDP growth

Number of participants

The state of the s	Weighted to Downside	Broadly Balanced	Weighted to Upside	
March projections	2		13	3
December projections	6		10	1

Note. The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in real gross domestic product (GDP) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years, more information about these data is available in table 2. Because current

conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections, these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.B. Uncertainty and risks in projections of the unemployment rate Median projection and confidence interval based on historical forecast errors

Unemployment rate

Percent

	2016	2017	2018	2019	2020	2021	2022	2023
Actual	4.8	4.2	3.8	3 6	6.7	-	-	-
Upper end of 70% Confidence Interval	-	<u></u>		-	-	5.3	5.3	5.4
Median		-	-	-	-	4.5	3.9	3.5
Lower End of 70% Confidence Interval	-	-	-	-	-	3.7	2.5	1.6

FOMC participants' assessments of uncertainty and risks around their economic projections

Histograms, two panels.

Uncertainty about the unemployment rate

Number of participants

	Lower Bro	adly Similar F	ligher
March projections	0	2	16
December projections	0	1	16

Risks to the unemployment rate

Number of participants

	Weighted to Downside	Broadly Balanced	Weighted to Upside	
March projections	2		15	1
December projections	0		10	7

Note. The blue and red lines in the top panel show actual values and median projected values, respectively, of the average civilian unemployment rate in the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years, more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections, these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty"

Figure 4.C. Uncertainty and risks in projections of PCE inflation

Median projection and confidence interval based on historical forecast errors

PCE inflation

Percent

The state of the s	2016	2017	2018	2019	2020	2021	2022	2023
Actual	16	18	2.0	1.5	1.2	<u></u>	-	-
Upper end of 70% Confidence Interval	-	-	-	-	-	3.3	3	3.2
Median	-	-	-	-	_	2.4	2.0	2 1
Lower End of 70% Confidence Interval	-	-	-		-	1.5	1	1

FOMC participants' assessments of uncertainty and risks around their economic projections

Histograms, four panels.

Uncertainty about PCE inflation

Number of participants

	Lower Bi	roadly Similar Higher	
March projections	0	2	16
December projections	0	3	14

Risks to PCE inflation

Number of participants

	Weighted to Downside	Broadly Balanced	Weighted to Upside
March projections	1	12	5
December projections	9	7	1

Uncertainty about core PCE inflation

Number of participants

	Lower	Broadly Similar	Higher
March projections	0		2 16
December projections	0		3 14

Risks to core PCE inflation

Number of participants

		Weighted to Downside	- 34 14	Broadly Balanced		Weighted to Upside	
March projec	ions		1		12		5
December pr	ojections		9		7		1

Note The blue and red lines in the top panel show actual values and median projected values, respectively, of the percent change in the price index for personal consumption expenditures (PCE) from the fourth quarter of the previous year to the fourth quarter of the year indicated. The confidence interval around the median projected values is assumed to be symmetric and is based on root mean squared errors of various private and government forecasts made over the previous 20 years, more information about these data is available in table 2. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the

uncertainty and risks around their projections, these current assessments are summarized in the lower panels. Generally speaking, participants who judge the uncertainty about their projections as "broadly similar" to the average levels of the past 20 years would view the width of the confidence interval shown in the historical fan chart as largely consistent with their assessments of the uncertainty about their projections. Likewise, participants who judge the risks to their projections as "broadly balanced" would view the confidence interval around their projections as approximately symmetric. For definitions of uncertainty and risks in economic projections, see the box "Forecast Uncertainty."

Figure 4.D. Diffusion indexes of participants' uncertainty assessments

Diffusion index

SEP	Change in real GDP	Unemployment rate	PCE inflation	Core PCE inflation
October 2007	0.76	0 53	0 35	0 00
January 2008	0.88	0.76	0 29	0 29
April 2008	0.82	0.71	0.59	0 41
June 2008	0.76	0.65	0.82	0 47
October 2008	1	0.94	0 65	0.71
January 2009	1	1	0.88	0.88
Aprıl 2009	1	1	0 82	0.82
June 2009	0 94	0 94	0.76	0.76
November 2009	0 94	0.82	0.76	0.82
January 2010	0 82	0 71	0 71	0.76
April 2010	0 71	0.76	0 71	0.65
June 2010	0 82	0.76	0.71	0.65
November 2010	0.89	0.83	0.72	0.72
January 2011	0.72	0.67	0.72	0.67
Aprıl 2011	0.59	0.65	0.71	0.59
June 2011	0.76	0.76	0 76	0 65
November 2011	0 94	0 82	0 65	0.59
January 2012	0.94	0.82	0 53	0.47
Aprıl 2012	0.76	0 76	0.47	0.35
June 2012	0.95	0 95	0 47	0 37
September 2012	0.89	0 89	0 37	0.32
December 2012	0.95	0.89	0 26	0.26
March 2013	0.63	0 63	0.16	0.16
June 2013	0 37	0.32	0 16	0.16
September 2013	0.24	0 24	0.12	0.12
December 2013	0 18	0.18	0	(
March 2014	0 12	0.12	0.06	0.06
June 2014	0 19	0.12	0.12	0 12
September 2014	0 24	0.24	0.06	0.06
December 2014	0 06	0.12	0.24	0.12
March 2015	0 12	0 12	0.24	0.18
June 2015	0 18	0.12	0.18	0.06
September 2015	0 12	0 06	0.18	0.18
December 2015	0.12	0 06	0 12	0.12
March 2016	0	0	0.12	0.06
June 2016	0.18	0.06	0.06	(
September 2016	0	0	0 12	-0 06
December 2016	0.35	0 29	0 24	0 18
March 2017	0.29	0 24	0.18	0 18
June 2017	0 12	0	0	C
		348		

348

SEP	Change in real GDP	Unemployment rate	PCE inflation	Core PCE inflation
September 2017	0.12	0	0	0
December 2017	0.12	0.12	0	0
March 2018	0.07	0.07	0	0
June 2018	0.07	0 07	0.07	0.07
September 2018	0.12	0.19	0 06	0.06
December 2018	0 18	0.29	0 06	0.06
March 2019	0 18	0 24	0 12	0.12
June 2019	0 35	0.47	0.18	0 18
September 2019	0 35	0.47	0 24	0 24
December 2019	0 24	0.24	0 12	0.12
June 2020	1	1	1	1
September 2020	1	1	0 94	0.94
December 2020	0.94	0.94	0.82	0.82
March 2021	0.83	0.89	0 89	0.89

Note: For each SEP, participants provided responses to the question "Please indicate your judgment of the uncertainty attached to your projections relative to the levels of uncertainty over the past 20 years " Each point in the diffusion indexes represents the number of participants who responded "Higher" minus the number who responded "Lower," divided by the total number of participants. Figure excludes March 2020 when no projections were submitted

Figure 4.E. Diffusion indexes of participants' risk weightings

Diffusion index

SEP	Change in real GDP	Unemployment rate	PCE inflation	Core PCE inflation
October 2007	-0 76	0.71	0.47	0.41
January 2008	-0.71	0.76	0 35	0.29
Aprıl 2008	-0 76	0.71	0 47	0.41
June 2008	-0.82	0.82	0.76	0 53
October 2008	-0.82	0.88	-0 29	-0.18
January 2009	-0.81	0.88	-0 44	-0 44
Aprıl 2009	-0 65	0.71	-0.24	-0 24
June 2009	-0.41	0 41	-0.06	-0 06
November 2009	-0.06	0.18	0	-0 06
January 2010	-0.06	0.18	0.06	0 06
Aprıl 2010	0 18	0.06	0	0
June 2010	-0.53	0 47	-0.18	-0 18
November 2010	-0 33	0 5	-0.17	-0.17
January 2011	0.11	0.11	0.06	0.06
Aprıl 2011	-0 12	0 06	0.47	0 35
June 2011	-0 65	0.53	0.29	0 24
November 2011	-0.65	0 65	-0.06	-0.06
January 2012	-0.65	0.59	0	0
April 2012	-0.47	0.53	0 18	0.12
June 2012	-0.79	0.68	-0 16	-0 16
September 2012	-0 74	0.68	-0.05	-0.05
December 2012	-0.68	0.68	-0.05	-0.05
March 2013	-0 42	0 32	-0 11	-0 11
June 2013	-0.37	0.32	-0 16	-0 16
September 2013	-0.47	0.24	-0 24	-0 24
December 2013	-0 12	0.06	-0.18	-0 18
March 2014	-0.12	349	-0 25	-0 25

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SEP	Change in real GDP	Unemployment rate	PCE inflation	Core PCE inflation		
June 2014	- 0 25	0.06	-0.12	-0.12		
September 2014	-0 18	-0.06	-0.24	-0.24		
December 2014	-0 12	-0 06	-0.29	-0 24		
March 2015	-0.24	0	-0 41	-0 41		
June 2015	-0 24	0.06	-0.24	-0.24		
September 2015	-0.41	0.29	-0 47	-0 47		
December 2015	-0.12	0	-0 41	-0.47		
March 2016	-0.47	0.12	-0 65	-0.59		
June 2016	-0 35	0.18	-0.35	-0.35		
September 2016	-0.18	0 06	-0 24	-0.24		
December 2016	0.18	-0 18	0.06	0 06		
March 2017	0.18	-0 24	0.18	0.18		
June 2017	0 06	-0.12	-0.06	-0 06		
September 2017	0	-0.06	-0.19	-0.19		
December 2017	0.19	-0 19	0	0		
March 2018	0.2	-0.27	0 2	0.2		
June 2018	0.07	-0.07	0 07	0.07		
September 2018	0.06	-0.06	0 19	0.19		
December 2018	-0.12	-0.06	0 06	0.06		
March 2019	-0.24	0 06	-0 18	-0.18		
June 2019	-0.82	0.71	-0 53	-0.53		
September 2019	-0.76	0.53	-0.29	-0.29		
December 2019	-0.53	0.47	-0.35	-0.35		
June 2020	-0.71	0.71	-0 76	-0.76		
September 2020	-0.65	0.65	-0 59	-0.59		
December 2020	-0.29	0.41	-0.47	-0 47		
March 2021	0.06	-0.06	0 22	0 22		

Note For each SEP, participants provided responses to the question "Please indicate your judgment of the risk weighting around your projections" Each point in the diffusion indexes represents the number of participants who responded "Weighted to the Upside" minus the number who responded "Weighted to the Downside," divided by the total number of participants. Figure excludes March 2020 when no projections were submitted.

Figure 5. Uncertainty and risks in projections of the federal funds rate Federal Funds Rate

Percent

	2016	2017	2018	2019	2020	2021	2022	2023
Actual	6	1.4	2.4	1.6	.1	-	-	-
Upper end of 70% Confidence Interval	-	-	-	-	-	1.1	2.3	2.6
Median	-	-	-	-	-	.1	.1	.1
Lower End of 70% Confidence	-	-	-	-	-	0	0	0
Interval								

Note The blue and red lines are based on actual values and median projected values, respectively, of the Committee's target for the federal funds rate at the end of the year indicated. The actual values are the midpoint of the target range, the median projected values are based on either the midpoint of the target range or the target level. The confidence interval around the median projected values is based on root mean squared errors of various private and government forecasts made over the previous 20 years. The confidence interval is not strictly consistent with the projections for the federal funds rate, primarily because these projections are not forecasts of the likeliest outcomes for the federal funds rate, but rather projections of participants' individual assessments of appropriate monetary policy. Still, historical forecast errors provide a broad sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the

macroeconomic variables as well as additional adjustments to monetary policy that may be appropriate to onset the effects of shocks to the economy.

The confidence interval is assumed to be symmetric except when it is truncated at zero - the bottom of the lowest target range for the federal funds rate that has been adopted in the past by the Committee. This truncation would not be intended to indicate the likelihood of the use of negative interest rates to provide additional monetary policy accommodation if doing so was judged appropriate. In such situations, the Committee could also employ other tools, including forward guidance and large-scale asset purchases, to provide additional accommodation. Because current conditions may differ from those that prevailed, on average, over the previous 20 years, the width and shape of the confidence interval estimated on the basis of the historical forecast errors may not reflect FOMC participants' current assessments of the uncertainty and risks around their projections.

* The confidence interval is derived from forecasts of the average level of short-term interest rates in the fourth quarter of the year indicated, more information about these data is available in table 2. The shaded area encompasses less than a 70 percent confidence interval if the confidence interval has been truncated at zero.

Table 2. Average Historical Projection Error Ranges

Percentage points

Variable	2021	2022	2023
Change in real GDP ¹	±1.6	±2 1	±2.2
Unemployment rate ¹	±0.8	±1 4	±1 9
Total consumer prices ²	±0.9	±1.0	±1.1
Short-term interest rates ³	±1 0	±2.2	±2 5

Note Error ranges shown are measured as plus or minus the root mean squared error of projections for 2001 through 2020 that were released in the spring by various private and government forecasters. As described in the box "Forecast Uncertainty," under certain assumptions, there is about a 70 percent probability that actual outcomes for real GDP, unemployment, consumer prices, and the federal funds rate will be in ranges implied by the average size of projection errors made in the past. For more information, see David Reifschneider and Peter Tulip (2017), "Gauging the Uncertainty of the Economic Outlook Using Historical Forecasting Errors. The Federal Reserve's Approach, "Finance and Economics Discussion Series 2017-020 (Washington Board of Governors of the Federal Reserve System, February).

- 1. Definitions of variables are in the general note to table 1. Return to table
- 2. Measure is the overall consumer price index, the price measure that has been most widely used in government and private economic forecasts. Projections are percent changes on a fourth quarter to fourth quarter basis. Return to table
- 3 For Federal Reserve staff forecasts, measure is the federal funds rate. For other forecasts, measure is the rate on 3-month Treasury bills. Projection errors are calculated using average levels, in percent, in the fourth quarter. Return to table

Forecast Uncertainty

The economic projections provided by the members of the Board of Governors and the presidents of the Federal Reserve Banks inform discussions of monetary policy among policymakers and can aid public understanding of the basis for policy actions. Considerable uncertainty attends these projections, however. The economic and statistical models and relationships used to help produce economic forecasts are necessarily imperfect descriptions of the real world, and the future path of the economy can be affected by myriad unforeseen developments and events. Thus, in setting the stance of monetary policy, participants consider not only what appears to be the most likely economic outcome as embodied in their projections, but also the range of alternative possibilities, the likelihood of their occurring, and the potential costs to the economy should they occur.

Table 2 summarizes the average historical accuracy of a range of forecasts, including those reported in past *Monetary Policy Reports* and those prepared by the Federal Reserve Board's staff in advance of meetings of the Federal Open Market Committee (FOMC). The projection error ranges shown in the table illustrate the considerable uncertainty associated with economic forecasts. For example, suppose a participant projects that real gross domestic product (GDP) and total consumer prices will rise steadily at annual rates of, respectively, 3 percent and 2 percent. If the uncertainty attending those projections is similar to that experienced in the past and the risks around the projections are broadly balanced, the numbers reported in

table 2 would imply a probability of about 70 percent that actual GDP would expand within a range of 1.4 to 4.6 percent in the current year, 0.9 to 5.1 percent in the second year, and 0.8 to 5.2 percent in the third year. The corresponding 70 percent confidence intervals for overall inflation would be 1.1 to 2.9 percent in the current year, 1.0 to 3.0 percent in the second year, and 0.9 to 3.1 percent in the third year. Figures 4.A through 4.C illustrate these confidence bounds in "fan charts" that are symmetric and centered on the medians of FOMC participants' projections for GDP growth, the unemployment rate, and inflation. However, in some instances, the risks around the projections may not be symmetric. In particular, the unemployment rate cannot be negative, furthermore, the risks around a particular projection might be tilted to either the upside or the downside, in which case the corresponding fan chart would be asymmetrically positioned around the median projection.

Because current conditions may differ from those that prevailed, on average, over history, participants provide judgments as to whether the uncertainty attached to their projections of each economic variable is greater than, smaller than, or broadly similar to typical levels of forecast uncertainty seen in the past 20 years, as presented in table 2 and reflected in the widths of the confidence intervals shown in the top panels of figures 4.A through 4.C. Participants' current assessments of the uncertainty surrounding their projections are summarized in the bottom-left panels of those figures. Participants also provide judgments as to whether the risks to their projections are weighted to the upside, are weighted to the downside, or are broadly balanced. That is, while the symmetric historical fan charts shown in the top panels of figures 4.A through 4.C imply that the risks to participants' projections are balanced, participants may judge that there is a greater risk that a given variable will be above rather than below their projections. These judgments are summarized in the lower-right panels of figures 4.A through 4.C.

As with real activity and inflation, the outlook for the future path of the federal funds rate is subject to considerable uncertainty. This uncertainty arises primarily because each participant's assessment of the appropriate stance of monetary policy depends importantly on the evolution of real activity and inflation over time. If economic conditions evolve in an unexpected manner, then assessments of the appropriate setting of the federal funds rate would change from that point forward. The final line in table 2 shows the error ranges for forecasts of short-term interest rates. They suggest that the historical confidence intervals associated with projections of the federal funds rate are quite wide. It should be noted, however, that these confidence intervals are not strictly consistent with the projections for the federal funds rate, as these projections are not forecasts of the most likely quarterly outcomes but rather are projections of participants' individual assessments of appropriate monetary policy and are on an end-of-year basis. However, the forecast errors should provide a sense of the uncertainty around the future path of the federal funds rate generated by the uncertainty about the macroeconomic variables as well as additional adjustments to monetary policy that would be appropriate to offset the effects of shocks to the economy.

If at some point in the future the confidence interval around the federal funds rate were to extend below zero, it would be truncated at zero for purposes of the fan chart shown in figure 5; zero is the bottom of the lowest target range for the federal funds rate that has been adopted by the Committee in the past. This approach to the construction of the federal funds rate fan chart would be merely a convention, it would not have any implications for possible future policy decisions regarding the use of negative interest rates to provide additional monetary policy accommodation if doing so were appropriate. In such situations, the Committee could also employ other tools, including forward guidance and asset purchases, to provide additional accommodation.

While figures 4.A through 4.C provide information on the uncertainty around the economic projections, figure 1 provides information on the range of views across FOMC participants. A comparison of figure 1 with figures 4.A through 4.C shows that the dispersion of the projections across participants is much smaller than the average forecast errors over the past 20 years.

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